User Notes for Revised GDR Correction Product (gcpb)

Send all product and document questions and suggestions to philip.s.callahan@jpl.nasa.gov . Questions specifically regarding PO-DAAC distribution of the GCP data should be sent to kelley.e.case@jpl.nasa.gov . Corrections and answers to questions of general interest will be posted on the PO-DAAC web site with the document.

The GDR Correction Product (GCP) has been revised; however there is no change in product format. The previous version of the Users Guide still applies with the notes and additions here. The main changes, explained in more detail below, are

(1) the TOPEX EM Bias (EMB) calculation has been corrected; this also affects the ionospheric correction.

(2) the TMR drift has been updated. It continued, at a somewhat lower overall rate, to cycle 241 (April 1998). Unfortunately, no correction for the effect of yaw steering mode is included in the TMR correction at this time.

This version of the GCP is distinguished by

(1) file names that begin with gcpb (rather than gcpa);

(2) in the file header the software version is given as

Correction_File_Gen_Software_Version = gcp-b.0-2002-09-29.psc;

The SIS version ID also includes the "b", but there is no change to the product format or the document.

GCP Revisions

1. EM Bias Calculation

Histograms of the original GCP (gcpa) showed unexpected noise (about +/- 2 mm) and some large outliers in the Iono correction. The problem was traced to the EMB correction. The main one was conceptual: Contrary to the assumption in the code, the TOPEX GDR EMB for C band uses the C band SWH (not K band). In addition, there were several small programming flaws that caused breakdowns for unusual data.

The revised EMB algorithm removes this scatter by treating C band properly. Points with no EMB correction on the GDR do not receive a GCP EMB correction. Also, unusual sigma0s are better trapped in the wind speed algorithm.

2. TMR Drift

The drift of the 18 GHz channel has been reanalyzed by C. Ruf. It was found that the drift continued into early 1998, although the overall rate was somewhat lower than previously estimated. The drift in brightness temperature (Tb) is actually caused by a change in isolation

within the radiometer making the change in Tb18 depend on Tb18 itself (i.e., the scene being viewed). The algorithm for the drift is now based simply on cycle number rather than time in years. The loss changes linearly from cycle 1 through cycle 240 and then is fixed for cycle 241 and onward.

The net effect of the Tb18 drift is that for cycles 241 and beyond the typical change in wet tropospheric path delay (wet_tropo_rad) is between about 6 and 7 mm.

Unfortunately, no correction for the effect of yaw steering mode is included in the TMR correction at this time. Brown, Ruf, & Keihm in an August 2002 memo suggest corrections to the TMR path delay (negative of range correction on GDR) of

Sinusoidal yaw = -2.4 mm
Fixed yaw = +1.4 mm.

The yaw state can be determined from the file #**tpx-yaw-fix-state.028** . Periods between

Start Yaw Ramp(Sinusoidal to Fixed BETAP=xx) yyyy-doyThh:mm:ss ccc ppp
Stop Yaw Ramp(Fixed to Sinusoidal) yyyy-doyThh:mm:ss ccc ppp

can be considered as Fixed and other periods as Sinusoidal. While Brown et als give an algorithm for the approximately 15 hour thermal settling time between the two states, that is not considered here.